

CLAIMS

What is claimed is:

1. A hand-held portable vacuum comprising:
 - a housing;
 - a dirt cup having an inlet and defining a container for storage of dirt and debris therein, the dirt cup being removably attached to the housing;
 - an impeller at least partially disposed in the housing;
 - a HEPA filter disposed between the impeller and the inlet, the HEPA filter being formed with a plurality of pleats;
 - means for swirling the incoming air about the dirt cup; and
 - a filter cleaning device coupled to at least one of the housing and the dirt cup, the filter cleaning device including at least one rib and a hub, the hub being coupled to one of the HEPA filter and the rib and configured to rotate the one of the HEPA filter and the rib about the other one of the HEPA filter to generate contact between the rib and the HEPA filter to at least partially dislodge accumulated dirt and debris from the pleats.
2. The hand-held vacuum of Claim 1, wherein the swirling means includes a flow deflector associated with the inlet of the dirt cup.
3. The hand-held vacuum of Claim 2, wherein the flow deflector is an elbow.

4. The hand-held vacuum of Claim 1, wherein the swirling means includes a plurality of vanes disposed in an axially spaced relation to the inlet.

5. The hand-held vacuum of Claim 4, wherein the vanes are associated with a prefilter, the vanes being disposed between the inlet and the HEPA filter.

6. The hand-held vacuum of Claim 1, wherein the hub includes a gripping portion that extends through the housing and is manually rotatable.

7. A hand-held portable vacuum comprising:
 - a housing;
 - an impeller at least partially disposed in the housing;
 - a dirt cup having an inlet and defining a container for storage of dirt and debris therein, the dirt cup being removably attached to the housing; and
 - a HEPA filter disposed between the impeller and the inlet.
8. The hand-held portable vacuum of Claim 7, wherein the HEPA filter is formed with a plurality of pleats.
9. The hand-held portable vacuum of Claim 8, further comprising a filter cleaning device associated with at least one of the housing and the dirt cup, the filter cleaning device including at least one rib and a hub, the hub being coupled to one of the HEPA filter and the rib and configured to rotate the one of the HEPA filter and the rib about the other one of the HEPA filter to generate contact between the rib and the HEPA filter to at least partially dislodge accumulated dirt and debris from the pleats.
10. The hand-held portable vacuum of Claim 9, wherein the hub is rotatably coupled to the housing.

11. The hand-held portable vacuum of Claim 10, wherein the HEPA filter is sealingly attached to the hub.

12. The hand-held portable vacuum of Claim 10, wherein the hub includes a plurality of drive tabs that meshingly engage a plurality of drive tabs formed on the HEPA filter.

13. The hand-held portable vacuum of Claim 10, further comprising a prefilter, the prefilter having a prefilter body that surrounds the HEPA filter, the prefilter body having an open end which is sealingly engaged with the HEPA filter.

14. The hand-held portable vacuum of Claim 10, further comprising a prefilter, the prefilter having a prefilter body that surrounds the HEPA filter, the rib extending from an interior surface of the prefilter body.

15. The hand-held portable vacuum of Claim 7, further comprising a prefilter, the prefilter having a prefilter body that surrounds the HEPA filter

16. The hand-held portable vacuum of Claim 15, wherein the prefilter body has an open end and the prefilter and HEPA filter are sealingly engaged to close the open end.

17. A method for filtering a dirt and debris laden air flow, the method comprising:

providing a hand-held vacuum with a housing, an impeller, an inlet, a container and a primary filter, the housing including a handle that permits a user to employ the hand-held vacuum for vacuuming with a single hand, the impeller being disposed within the housing, the inlet being configured to receive the dirt and debris laden air flow therethrough, the container being configured to retain dirt and debris removed from the dirt and debris laden air flow and the primary filter being disposed between the impeller and the inlet;

rotating the impeller to generate the dirt and debris laden air flow; and

swirling the dirt and debris laden air flow about the interior of the container.

18. The method of Claim 17, further comprising removing the container from the housing to empty the container.

19. The method of Claim 18, wherein the container and the inlet are fixedly coupled to one another.

20. The method of Claim 17, further comprising pivoting the inlet relative to the housing to gain access to the container.

21. The method of Claim 20, further comprising rotating the housing with the single hand grasping the handle to overturn the vacuum and empty the container.

22. A hand-held portable vacuum comprising:

- a housing having a handle;
- a dirt cup having an inlet and defining a container for storage of dirt and debris therein, the dirt cup being removably attached to the housing;
- an impeller at least partially disposed in the housing;
- a filter disposed between the impeller and the inlet, the filter being formed with a plurality of pleats;
- a filter cleaning device coupled to at least one of the housing and the dirt cup, the filter cleaning device including at least one rib and a hub, the hub being coupled to one of the filter and the rib and configured to rotate the one of the filter and the rib about the other one of the filter to generate contact between the rib and the filter to at least partially dislodge accumulated dirt and debris from the pleats.

23. The hand-held vacuum of Claim 22, wherein the hub is rotatably coupled to the housing.

24. The hand-held portable vacuum of Claim 23, wherein the hub includes a gripping portion that extends through the housing and is manually rotatable.

25. The hand-held portable vacuum of Claim 23, wherein the filter is sealingly attached to the hub.

26. The hand-held portable vacuum of Claim 23, wherein the hub includes a plurality of drive tabs that meshingly engage a plurality of drive tabs formed on the filter.

27. The hand-held portable vacuum of Claim 23, further comprising a prefilter with a prefilter body that surrounds the filter, the prefilter body having an open end which is sealingly engaged with the filter, the rib extending from an interior surface of the prefilter body.

28. The hand-held portable vacuum of Claim 27, wherein the prefilter body has an open end and the prefilter and filter are sealingly engaged to close the open end.

29. The hand-held portable vacuum of Claim 27, wherein the prefilter body has a truncated cone shape.

30. The hand-held portable vacuum of Claim 29, wherein the filter has a truncated cone shape.

31. The hand-held portable vacuum of Claim 22, wherein the filter has a truncated cone shape.

32. A hand-held portable vacuum comprising:

- a housing having a handle;
- a dirt cup having an inlet and defining a container for storage of dirt and debris therein, the dirt cup being removably attached to the housing;
- an impeller at least partially disposed in the housing, the impeller being operable for generating an air flow that flows through the inlet;
- a filter disposed between the impeller and the inlet; and
- means for swirling the air flow about the dirt cup.

33. The hand-held vacuum of Claim 32, wherein the swirling means includes a flow deflector associated with the inlet of the dirt cup.

34. The hand-held vacuum of Claim 33, wherein the flow deflector is an elbow.

35. The hand-held vacuum of Claim 32, wherein the swirling means includes a plurality of vanes disposed in an axially spaced relation to the inlet.

36. The hand-held vacuum of Claim 35, wherein the vanes are associated with a prefilter, the vanes being disposed between the inlet and the filter.

37. A hand-held portable vacuum comprising:
- a housing having a handle;
 - a dirt cup having an inlet and defining a container for storage of dirt and debris therein, the dirt cup being removably attached to the housing;
 - an impeller at least partially disposed in the housing, the impeller being operable for generating an air flow that flows through the inlet;
 - a filter disposed between the impeller and the inlet; and
 - a flow deflector associated with the inlet of the dirt cup, the flow deflector being configured to direct the air flow toward an interior surface of the dirt cup in a manner that causes dirt and debris entrained in the air flow to swirl about the interior surface of the dirt cup.
38. The hand-held vacuum of Claim 37, wherein the flow deflector is an elbow that is coupled to the inlet.